Erskine Commons Redevelopment Project, South Bend

Use of Institutional and Engineering Controls to Provide for Productive Use of a Former Landfill

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Site Location

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The Setting

- 55 Acre Development Property
  - >16 Acre “Fitterling” Former Landfill
  - Commercial Properties
  - Residential Properties
- Relatively Uniform Sand Deposits
- Unconfined Aquifer – Water Table at ~35 ft. to >75 ft. bgs
- Over 45 ft. of Topographic Relief
- Prospective Location for a Commercial Development with two Large Anchors (“big boxes”) and Smaller Retail Stores in Outlots

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The Landfill

- Probably Created as Borrow for Nearby Road Construction in the 1960s
- Contains Foundry Sand (the primary component), Slag, Soil, Construction & Demolition Debris (bricks, concrete wood, etc.), Automobile Tires and Industrial Wastes
- Variable Soil and Vegetative Cover
- Ranges in Thickness from a few Inches to >40 ft.
- Irregular Boundaries, which are Difficult to Define
- Base of Landfill Material Above Water Table

The Players

- The Developer: Anchor Properties
- The End Users:
  - Wal-Mart
  - Lowe's
- The Regulator: IDEM
- The Facilitator: City of South Bend
- Bit Players:
  - Environmental Consultants
  - Site Civil Consultants
  - Geotechnical Consultants
  - An Army of Attorneys

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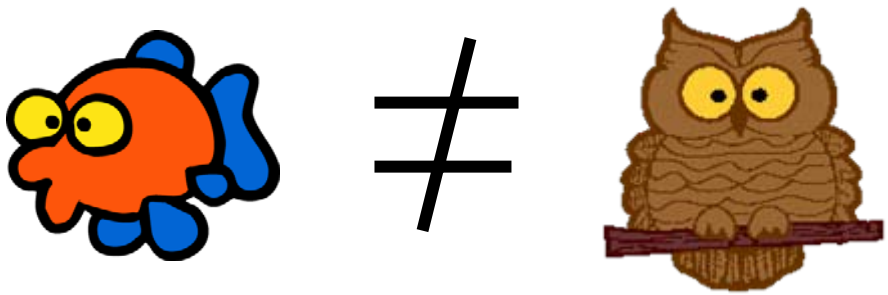
The Challenges

- The Former Landfill
  - Potential Ongoing Releases
  - Risks to Construction Workers during Development
  - Risks to Future Commercial Workers and Patrons
  - Potential Geotechnical Limitations
- Soil Balancing/Site Grading
- Management of Liabilities for Developer and End Users
- Regulatory Angst – the “neither fish nor fowl” conundrum



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The Solution

- Thorough Investigation of the Former Landfill and Surrounding Properties
- Communication and Careful Coordination Between IDEM, the City of South Bend, the Developer (and his engineers) and the End Users
- Preparation of a Corrective Action Plan that:
  - Mitigates Current and Future Environmental Risks
  - Addresses Multiple Regulatory Issues
  - Is Pragmatic, Allowing for Technically Achievable, (relatively) Cost Effective and Timely Development
  - Provides for a Productive End Use for the Property

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The Solution (Cont'd)

- Development of Comfort Letter Language Letter that:
  - Provides End Users with Status Analogous to Bona Fide Prospective Purchasers
  - Preserves Custodial Obligations for the Property
  - Allows Access for Regulatory Agency Involvement under Appropriate Conditions

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Landfill Investigations

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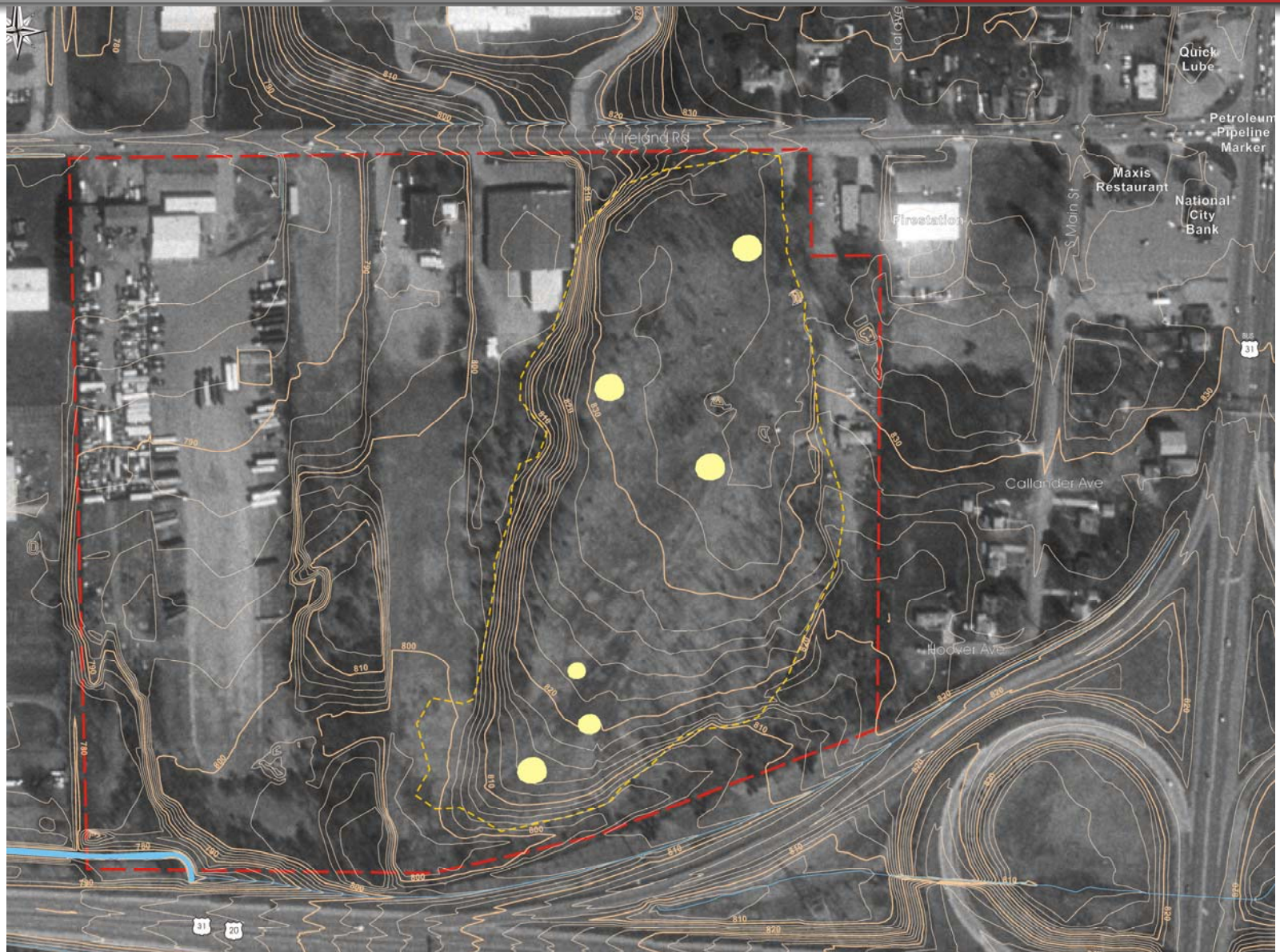
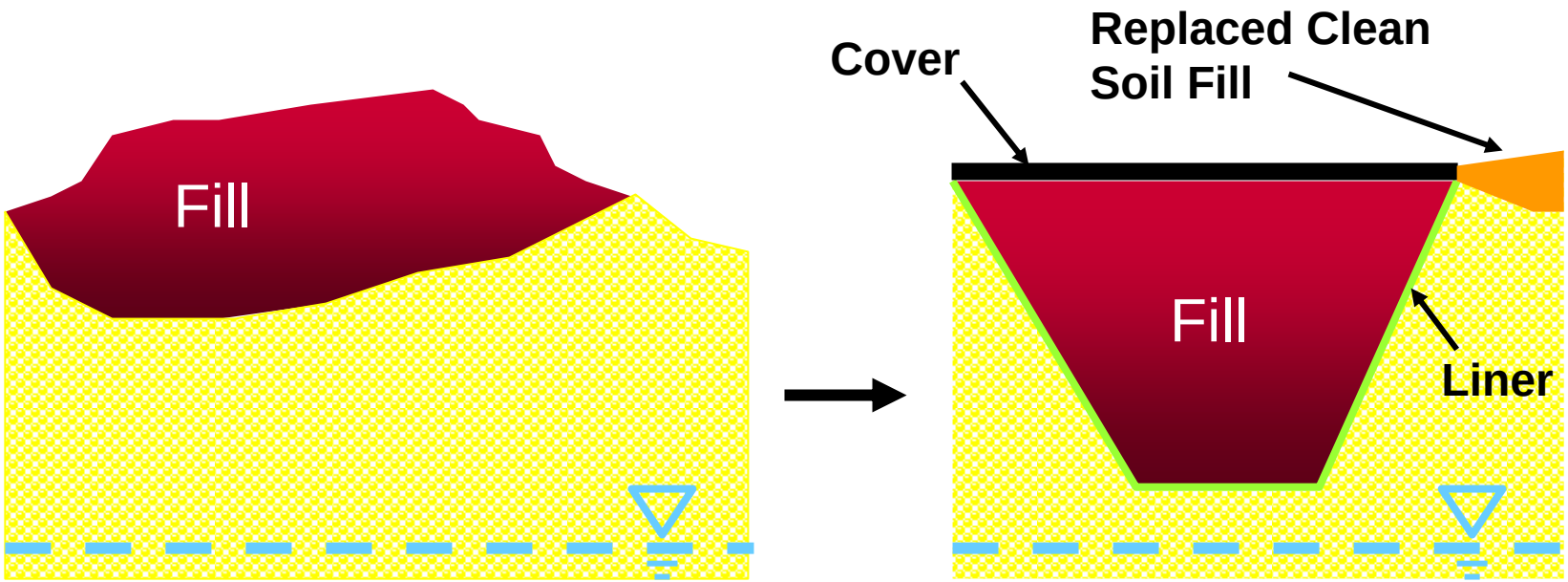
Areas Exceeding Direct Contact Standards



The Balancing Act

- Fill Material Requires Consolidation within Original Landfill Footprint
- Large Volumes of Clean Soil Fill Required to Bring Site to Grade



Engineering Controls

- The Belt
  - Geosynthetic Clay and/or Recompacted Clay Liner with Protective Layer at Base of Liner for Consolidated Landfill Materials
  - Leachate Collection in Consolidated Landfill
  - Cover by Engineered Parking Lot (asphalt or concrete with sub-base) and Landscape Areas

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Engineering Controls (Cont'd)

- The Suspenders
  - Methane Migration Mitigation (bulkheads for utilities, sub-slab liners and passive vent systems for buildings)
  - Operation & Maintenance Plan
    - Parking Lot Inspection and Maintenance
    - Excavation Limitations and Directives
    - Leachate Collection
    - Groundwater Monitoring
    - Methane Monitoring

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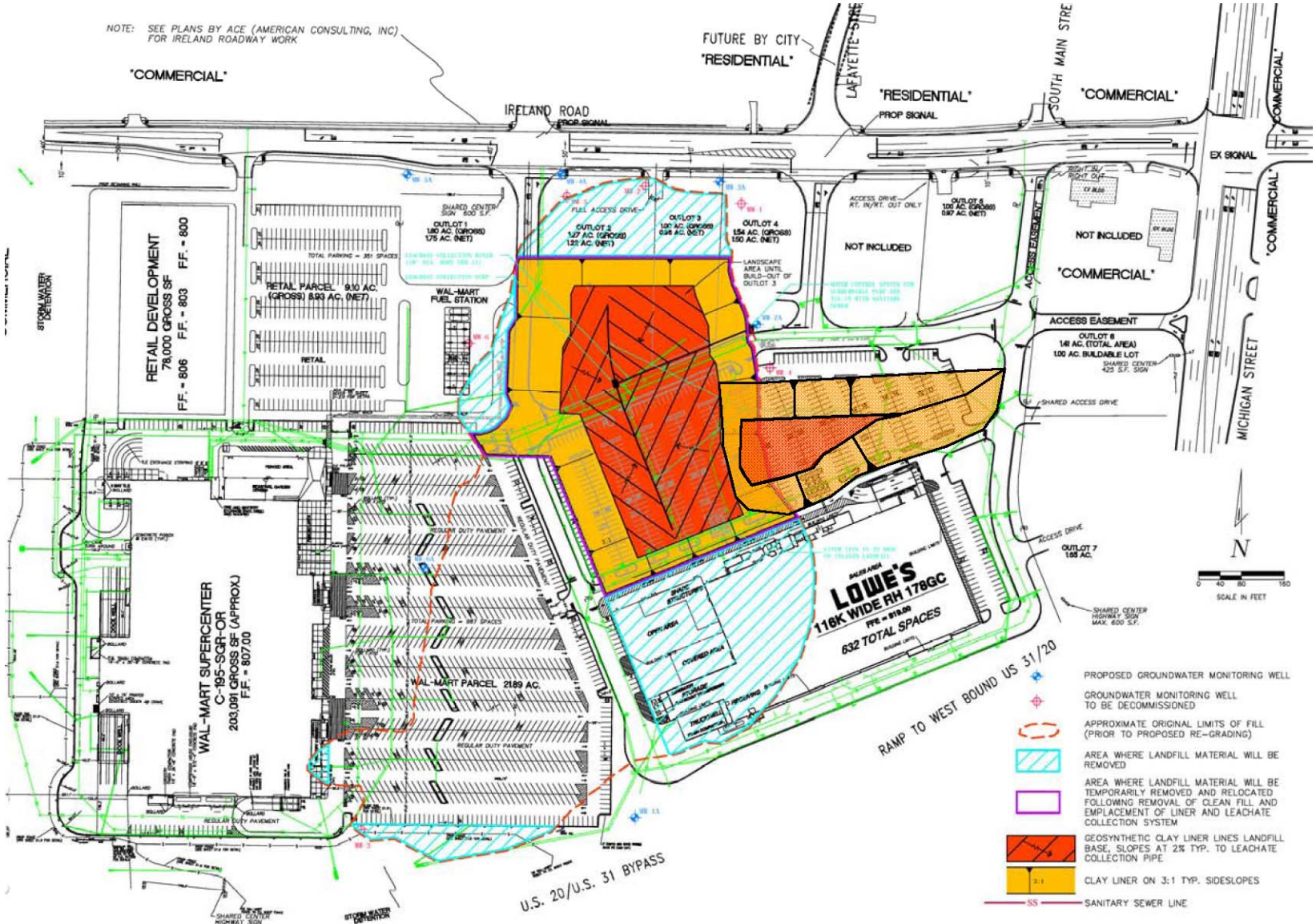
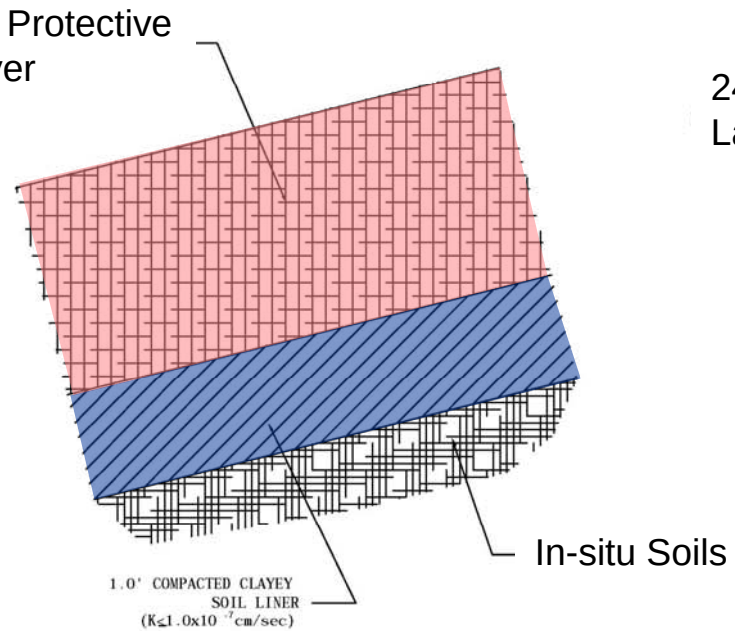
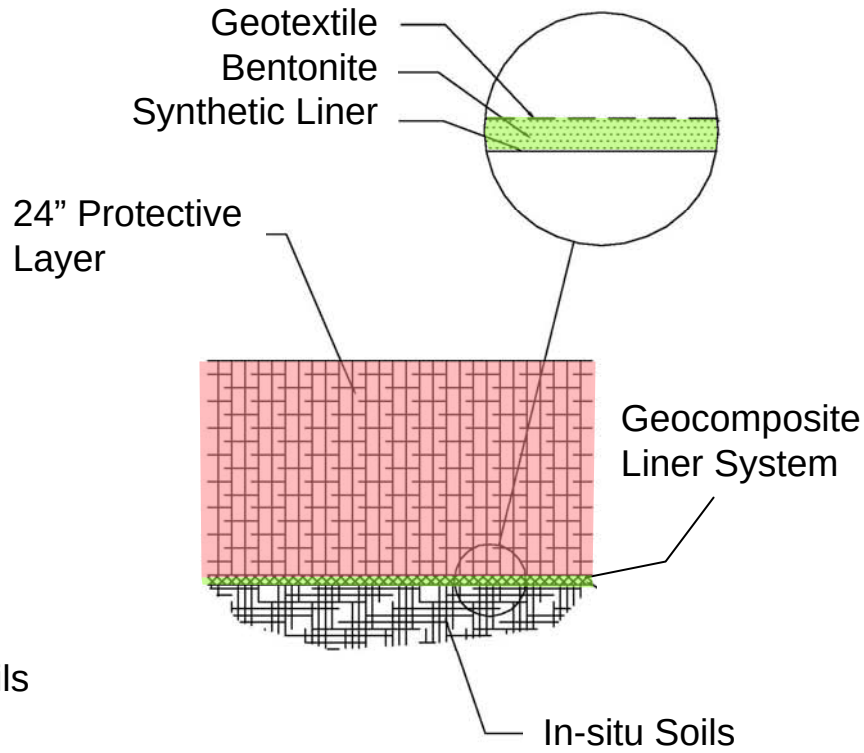
Generalized Consolidation Cell Lay-out



Liner Details



Typical Liner Detail – Sideslope



Typical Liner Detail – Base

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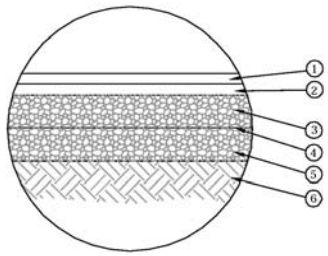
ANCHOR PROPERTIES
ERSKINE COMMONS SHOPPING CENTER

FIGURE 7
LANDFILL LINER DETAIL SHEET

CITY OF SOUTH BEND, ST. JOSEPH COUNTY, INDIANA

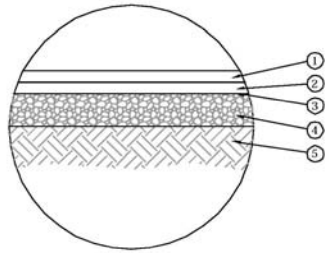
PROJECT NO.: AA1007	SUBMITTAL DATE: JANUARY 2005
CAD DWG FILE: AA1007.100.0001.GAC	PLOT DATE: 1/26/05

Cover Detail Examples



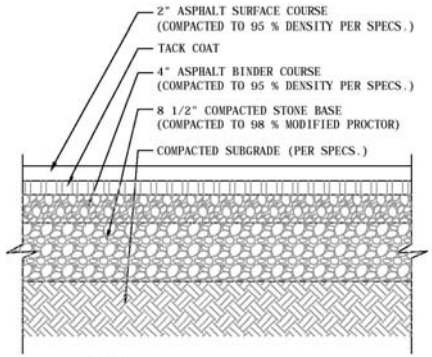
1. ITEM 404 - 1 1/2" ASPHALT CONCRETE
2. ITEM 402 - 1 1/2" ASPHALT CONCRETE
3. ITEM 301 - 6" BITUMINOUS AGGREGATE BASE
4. ITEM 408 - PRIME COAT (0.35 GALLON PER SQUARE YARD)
5. ITEM 304 - 6" AGGREGATE BASE
6. ITEM 203 - SUBGRADE COMPACTION

1 HD PAVING SECTION
SCALE: N.T.S.



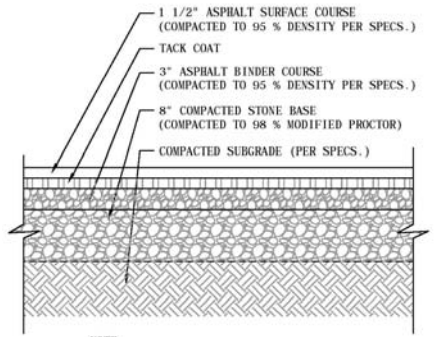
1. IDOT ITEM 448, TYPE 1 - 1 1/2" ASPHALT CONCRETE
2. IDOT ITEM 448, TYPE 2 - 1 1/2" ASPHALT CONCRETE
3. ITEM 408 - PRIME COAT (0.35 GALLON PER SQUARE YARD)
4. ITEM 304 - 8" AGGREGATE BASE
5. ITEM 203 - SUBGRADE COMPACTION

2 LD PAVING SECTION
SCALE: N.T.S.



NOTE:
USE LOWE'S MINIMUM PAVEMENT SECTION IF GREATER THAN GEOTECHNICAL ENGINEERS RECOMMENDATION.

4 HEAVY DUTY ASPHALT PAVEMENT SECTION
SCALE: 1"=1'-0"



NOTE:
USE LOWE'S MINIMUM PAVEMENT SECTION IF *GREATER THAN GEOTECHNICAL ENGINEERS* RECOMMENDATION.

5 STANDARD DUTY ASPHALT PAVEMENT SECTION
SCALE: 1"=1'-0"

Institutional Controls

- Environmental Restrictive Covenant (ERC) to Include:
  - Limit Future Use in Affected Area to Commercial/Industrial Land use
  - Prohibit Installation and Use of Wells on the Real Estate for Potable Uses
  - Require Maintenance of the Parking Lot (i.e., barrier to direct contact with fill materials)
  - Place Conditions on the Excavation or Off-Site Disposal of Subsurface Materials on or from the Affected Area
  - Require Property Owner to Perform or Allow Others to Perform Periodic Monitoring of Groundwater and Methane Vapors
- ERC must be Executed and Recorded before a Comfort Letter may be Issued

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Fill and Borrow Excavation

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Geosynthetic Liner Installation

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Leachate Line Installation

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Fill Material Consolidation

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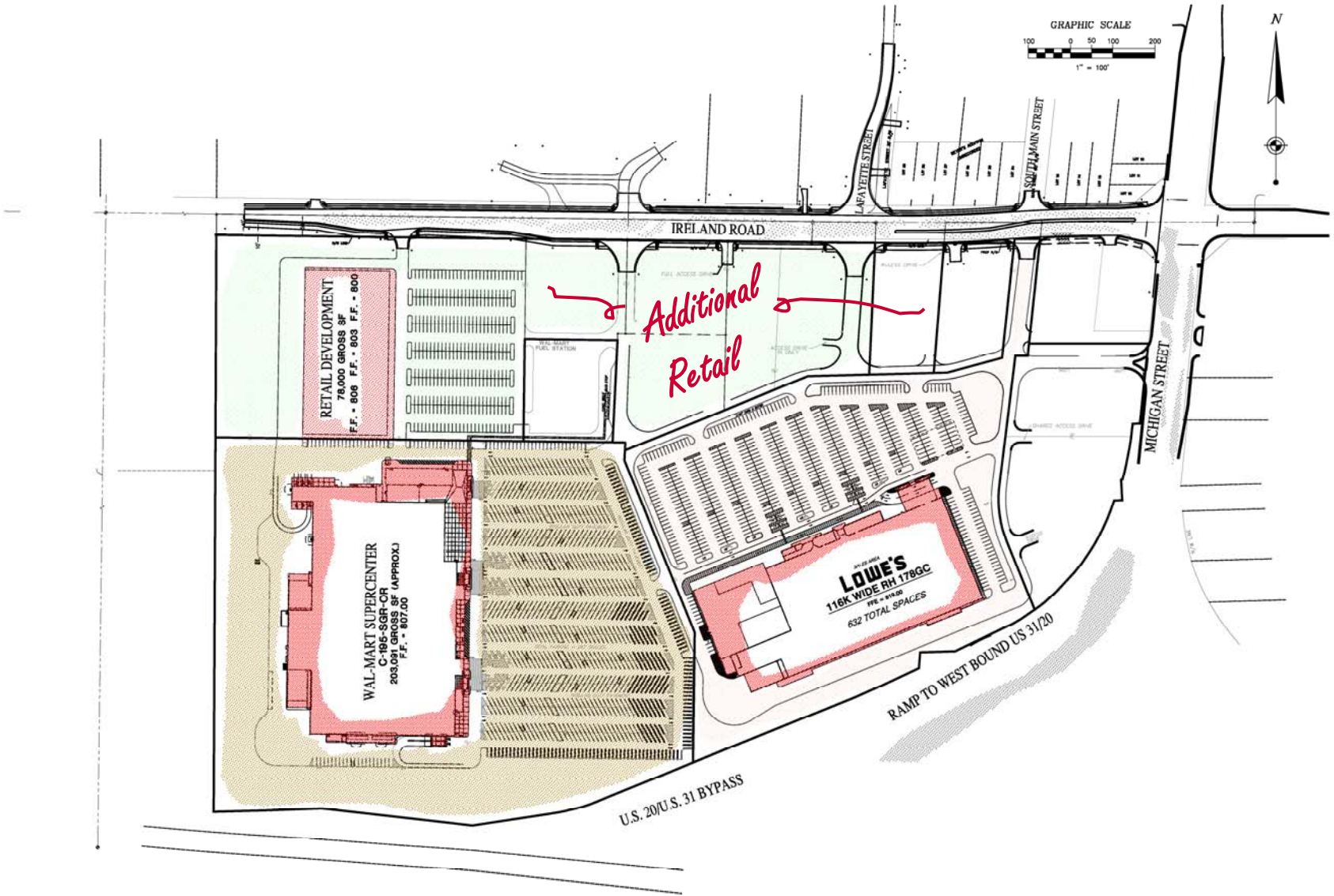
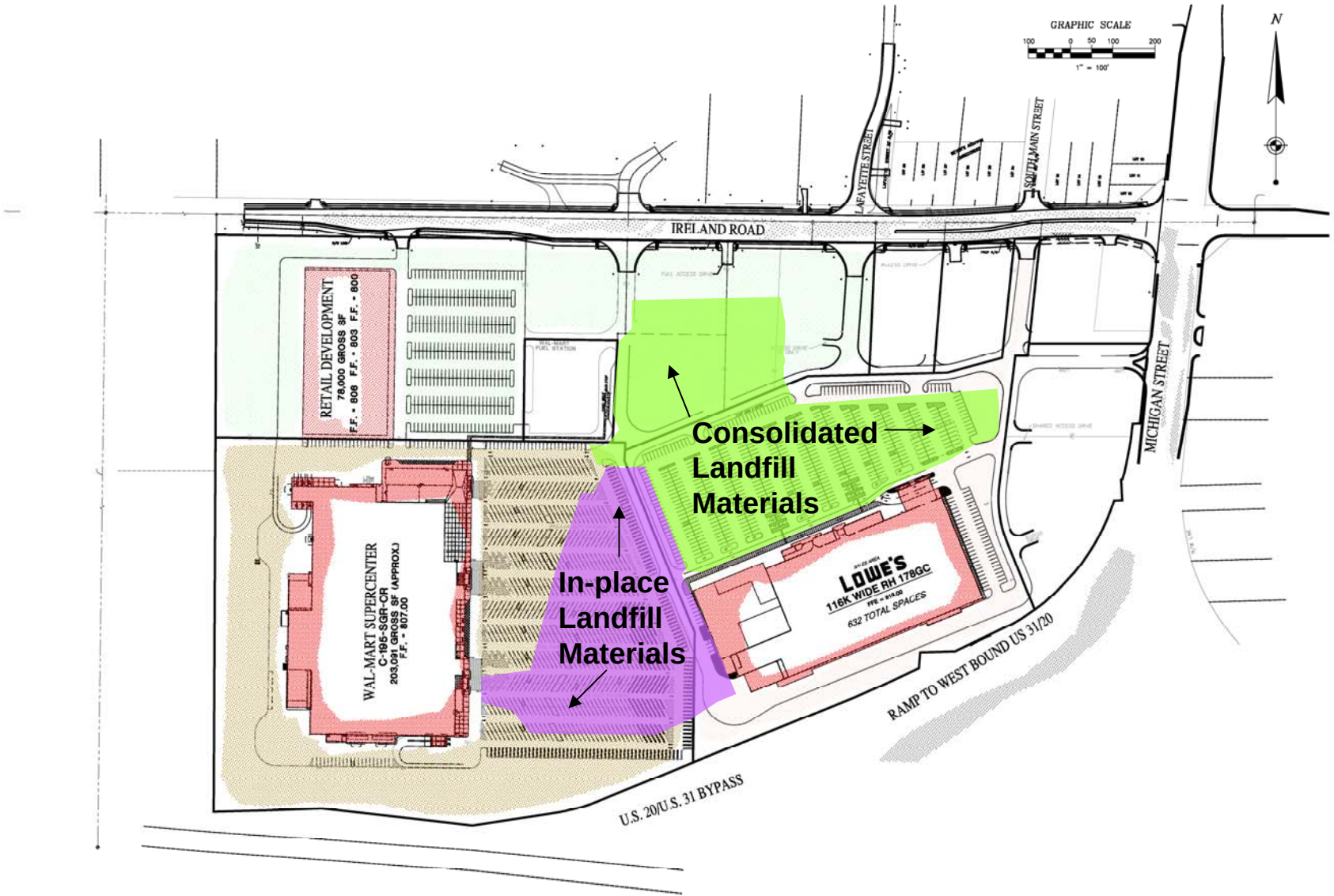
Proposed Commercial Development



Post-development Distribution of Landfill Materials



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The Status

- Landfill Materials have been Consolidated in GCL-lined Cells with Leachate Collection Systems in Place
- Interim Cover has been Placed over Landfill Material – Awaiting Cooperative Weather for Construction of Sub-Base and Parking Lots
- Clean Soil Backfill has been Tested and Placed around the Property – Building Pads are Ready
- Utilities are being Installed along with Methane Migration Bulkheads

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The Status (Cont'd)

- Two Rounds of Groundwater Monitoring have been Completed
- An "Initial IDEM Activities" Report has been Prepared
- Anchor Store Openings Expected within One Year

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Construction Status

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Conclusions

- The Project was Made Possible by Early Cooperation, Understanding, Patience by IDEM and other Parties
- Engineering Controls, as Defined in a Corrective Action Plan, Provided a Roadmap for Development and Construction while Mitigating Risks
- Institutional Controls Provided:
  - a Means by which the Ultimate Owners could Manage Risks (while still protecting the value of investments)
  - Controls for Ongoing Protection of Human Health and the Environment